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Bureau of Land Management

Environmental Assessment
DOI-BLM-UT-G020-2016-0024-EA

October 2016

Range Creek Rotenone Treatment

Location:
T. 14 S., R. 14 E., Sec's.11, 13, 14, 24, 25 & 36;
T. 15 S., R. 14 E., Sec's. 1;
T. 15 S., R. 15 E., Sec's. 6, 7, 17, 18, 20, 28, 29, & 33;
T. 16 S., R. 15 E., Sec's. 3, 10, 11, 14, 23, & 24;
T. 16 S., R. 16 E., Sec's. 19, 30, 31, 32, & 33;
T. 17 S., R. 16 E., Sec's. 4, 9, 10, & 15

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1.0 PURPOSE & NEED

Introduction

This Environmental Assessment (EA) has been prepared to disclose and analyze the environmental consequences of doing a rotenone treatment in the Range Creek drainage as proposed by the Utah Division of Wildlife Resources. The EA is a site-specific analysis of potential impacts that could result with the implementation of the proposed action or alternatives to the proposed action. The EA assists the BLM in project planning and ensuring compliance with the National Environmental Policy Act (NEPA), and in making a determination as to whether any "significant" impacts could result from the analyzed actions. "Significance" is defined by NEPA and is found in regulation 40 CFR 1508.27. An EA provides evidence for determining whether to prepare an Environmental Impact Statement (EIS) or a statement of "Finding of No Significant Impact" (FONSI). If the decision maker determines that this project has "significant" impacts following the analysis in the EA, then an EIS would be prepared for the project. If not, a Decision Record may be signed for the EA approving the selected alternative, whether the proposed action or another alternative. A Decision Record (DR), including a FONSI statement, documents the reasons why implementation of the selected alternative would not result in "significant" environmental impacts (effects) beyond those already addressed in the Price Field Office Resource Management Plan October 2008.

1.2 Background

Colorado River Cutthroat Trout are the only trout species native to the Colorado River Drainage. Historically, Colorado River cutthroat trout (CRCT) were distributed in all suitable waters of the drainage (Behnke 1992). Currently however, CRCT exist only within fragmented components of their historic range (Lentsch and Converse1997, Behnke 1992). Their decline is attributed to loss of habitat, interspecific competition from non-native fishes (i.e., brook or brown trout), and loss of genetic purity from hybridization with rainbow and other subspecies of cutthroat trout. CRCT were petitioned for listing as a threatened species under the Endangered Species Act (ESA) in May 2000. (Greenwald 2000).

In April 2004, the United States Fish and Wildlife Service (USFWS) ruled listing CRCT under ESA protection was not warranted at this time (USFWS 2004). One reason cited by the USFWS for not listing CRCT was a significant conservation effort had already been implemented by the states of Utah, Colorado and Wyoming. Furthermore, the USFWS believed the conservation effort by the states to restore CRCT would continue.

As part of this continued effort, the Utah Division of Wildlife Resources (UDWR) has identified Range Creek as a major drainage east of the Price River to actively try and restore native CRCT. Nonnative brown trout and Yellowstone cutthroat trout have been stocked into the drainage (UDWR unpublished data). As a result, native CRCT populations in Range Creek have hybridized with Yellowstone cutthroat trout and genetically pure CRCT populations no longer exist in the drainage.

1.3 Need for the Proposed Action

Range Creek is a major drainage east of the Price River on the Tavaputs Plateau. There are approximately 26 miles of stream in the drainage. Nonnative brown trout and Yellowstone cutthroat trout have been stocked into the drainage. As a result, native CRCT populations in Range Creek have hybridized with Yellowstone cutthroat trout and genetically pure CRCT populations no longer exist in the drainage.

1.4 Purpose of the Proposed Action

The purpose of the proposed action is to eliminate non-native fishes (i.e. Yellowstone Cutthroat Trout and Brown Trout) in order to facilitate the recovery of the CRCT. Due to the competitiveness of the non-native species, these populations need to be eradicated before CRCT can be established. Removing non-native fish from Range Creek will be a positive step toward achieving the goals of the CRCT conservation agreement.

1.5 Conformance with BLM Land Use Plan(s)

The proposed action works directly towards the stated goals for special status species on page 79 of the Price Field Office Resource Management Plan (RMP) (October 2008).

Goal:

- Maintain, protect, and enhance habitats (including but not limited to designated critical habitat) and actively promote recovery, maintenance, protection, and enhancement of populations and habitats of BLM, non-listed, special status plant and animal species to ensure that actions authorized, funded, or carried out do not contribute to the need for these species to be listed as T&E under the Endangered Species Act

Management Decisions:

- SSS-6 – Where possible, implement the conservation actions identified in the Utah Comprehensive Wildlife Conservation Strategy (Gorrell et al. 2005), which identifies priority wildlife species and habitats, identifies and assesses threats to their survival, and identifies long-term conservation actions needed, including those on BLM-administered lands.

1.6 Relationship to Statutes, Regulations, or Other Plans

This EA is being prepared in accordance with the National Environmental Policy Act for projects involving federal lands. The proposed project is consistent with all federal laws and regulations. The BLM in conjunction with UDWR will include a Pesticide Use Plan (PUP) and a permit from the National Pollutant Discharge Elimination System (NPDES).

Clean Water Act

On November 27, 2006, the U.S. Environmental Protection Agency (EPA) issued a final rule (71 Federal Register 68483) concluding that pesticides when applied to or near waters of the United States in accordance with the Federal Insecticide, Fungicide, and Rodenticide Act are exempt from the Clean Water Act permitting requirements. However, on January 7, 2009 the United States Court of Appeals for the Sixth Circuit (National Cotton Council vs. EPA) vacated the Final Rule, thereby requiring discharges of pesticides to comply with the NPDES permitting process. Following the ruling, the EPA was granted a stay of the mandate until April 9, 2011, during which time EPA will work with NPDES authorized states to develop general permits. The effects of the project on water quality are analyzed in their appropriate sections.

1.7 Identification of Issues

Identification of issues for this assessment was accomplished by considering the resources that could be affected by implementation of the alternatives considered, as well as through involvement with the public and input from the Interdisciplinary Team. Public involvement consisted of posting the proposal on the Utah BLM Environmental Notification Bulletin Board in February 2014. Coordination with Utah Division of Wildlife Resources and U.S. Fish and Wildlife Service continued through the development of the EA. Interdisciplinary team analysis identified potential impacts (PI) from the proposed action to resources listed below:

1.7.1 Surface Water Quality

- A SARA Title III substance will be injected into the waters of the US. How will this affect surface water quality? How will detoxification of the treated water affect the water quality?

1.7.2 Fish and Wildlife Excluding USFWS Designated Species

- How will the introduction of rotenone into Range Creek impact fish, amphibians, and aquatic invertebrates?

1.7.3 Waste and Hazardous Materials

- Rotenone is considered an acute health hazard under SARA Title III. What are the health concerns for the users of the treatment? How will effects of the treatment be avoided concerning the users?

- Rotenone is a pesticide that is extremely toxic to fish and humans. The proposed action will eliminate all fish within the project area. The reintroduction of native fish should not occur for a minimum of 2-4 weeks after treatment. An NPDES permit may need to be acquired from the EPA before treatment. A PUP is required for all chemical applications applied on BLM administered lands prior to treatments and a PAR is required to be submitted to the BLM office within 24 hours after chemical applications.

Those elements either not present (NP) or present but not impacted (NI) are not listed (see Appendix A).

1.8 Summary

This chapter has presented the purpose and need of the proposed project, as well as the relevant issues, i.e., those elements of the human environment that could be affected by the implementation of the proposed project. In order to meet the purpose and need of the proposed project in a way that resolves the issues, the BLM has considered and/or developed a range of action alternatives. These alternatives are presented in Chapter 2. The potential environmental impacts or consequences resulting from the implementation of each alternative considered in detail are analyzed in Chapter 4 for each of the identified issues.

2.0 DESCRIPTION OF ALTERNATIVES, INCLUDING PROPOSED ACTION

2.1 Introduction

This Environmental Assessment focuses on the proposed action and no action alternatives. The no action alternative is considered and analyzed to provide a baseline for comparison of the impacts of the proposed action.

2.2 Alternative A – Proposed Action

The UDWR is proposing to treat approximately 20 miles of stream in the Range Creek drainage with rotenone to remove nonnative brown trout and hybridized cutthroat trout (for a full copy of the proposed rotenone plan, see Appendix B). It is expected that two rotenone treatments over consecutive years will be needed to effectively remove all unwanted trout species from Range Creek. Once completed, UDWR would then re-introduce native CRCT and potentially bluehead suckers into the Range Creek drainage.

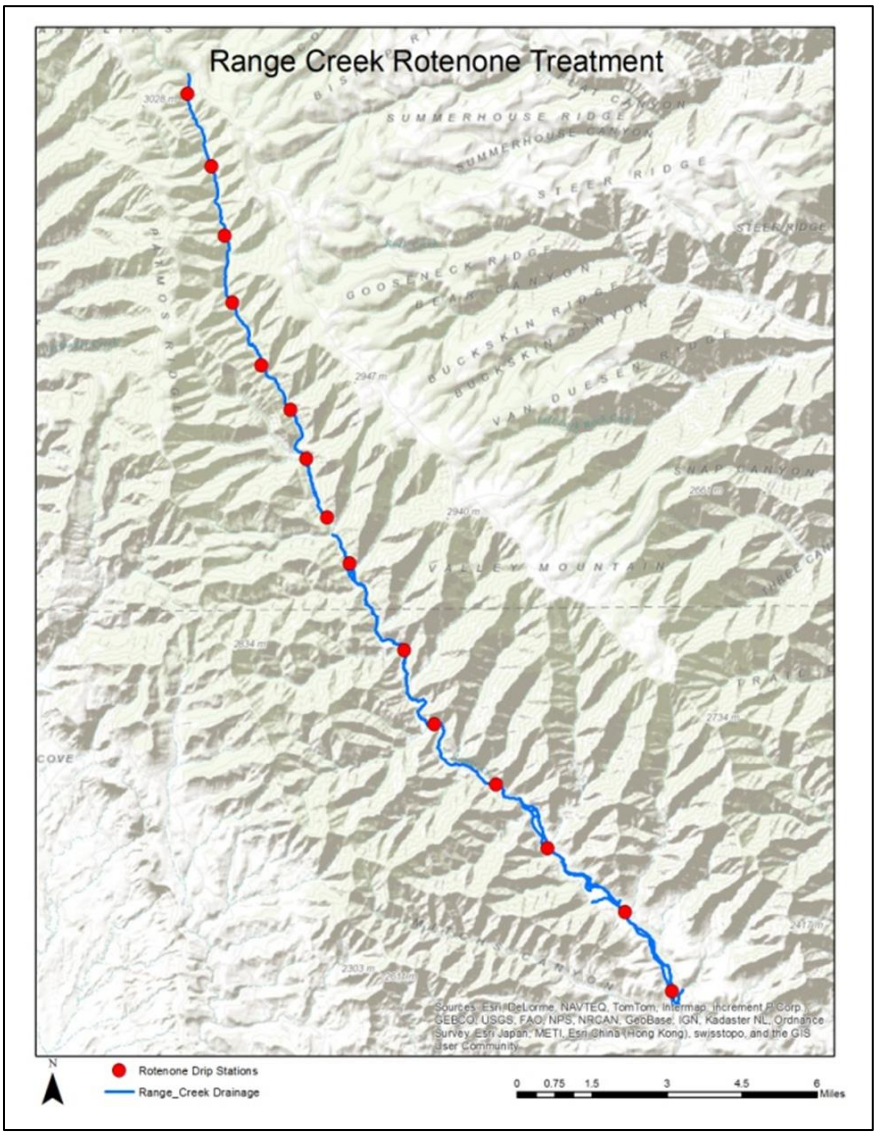

Figure 1. Map showing stream sections of Range Creek that will be treated with rotenone to remove nonnative trout.

Pre-treatment

During the year the project is scheduled, public notification will begin in March. Preparation for the actual treatment will begin early in the summer of the treatment year. During this time any extra safety equipment for the project will be purchased. One to two weeks before treatment, flows will be calculated to determine the actual amount of rotenone that will be needed for the treatment. Range Creek will also be checked for any beaver dams or obstructions during this same period. If any obstructions are found they will be documented and potentially removed. Project participants will meet one week before treatment to review project details, safety issues and assignments. Transportation of gear, equipment and chemical to the project area will begin on the first Monday after this meeting.

Treatment

Liquid emulsifiable rotenone (Prenfish, 5% Active Ingredient, EPA Registration No. 655-422) will be used to treat stream sections of Range Creek. Rotenone will be applied at the rate of 1.0 parts per million (ppm) from drip stations located at between 0.5 and 2.0 mile intervals for a 8-hour period (Tables 2 and 3, Figure 2). Springs and backwaters containing fish not effectively treated by drip stations will be treated using pressurized backpack sprayers. A small amount of sand and gelatin mixed with powdered rotenone (7.5% Active Ingredients, EPA registration number 655-691) may be used to create chemical dams to prevent fish from escaping into small side tributaries or swamps. Sentinel fish will be placed in live cages throughout the treatment area to monitor the effectiveness of the process. A bioassay will be run on the rotenone prior to the treatment to verify its degree of toxicity.

Potassium permanganate ($KMnO_4$) will be applied at 2.0 ppm to neutralize rotenone treated water just below the barrier location on Range Creek. At an application rate of 2.0 ppm the neutralization zone should be approximately 30 minutes. That is, rotenone treated water should be completely neutralized within the time it travels for 30 minutes below where potassium permanganate is added. Within the 30-minute neutralization zone, fish mortality will still occur, and below the neutralization zone mortality should not be observed. Potassium permanganate will be dispensed into the stream with a power auger dispenser powered by a generator (AFS Task Force 2000). Operation of the neutralizing station for 2 days will require 64.6 pounds of $KMnO_4$ based on a flow at the barrier of 3.0 cubic feet per second (cfs). Potassium permanganate will be dispensed into the stream at a rate of 1.35 pounds per hour.

Application of rotenone will occur over the course of 1 day. Roaming crews with backpack sprayers and rotenone-sand mix will also begin coverage of their assigned areas at this time. Access to the Range Creek drainage will be restricted for the few days during the treatment.

Post-Treatment

If the drainage is deemed clear of nonnative salmonids after the second treatment, then CRCT will be restocked into the drainage either during the fall after treatment or early the next summer. Annual monitoring in the stream will occur for five years to document CRCT establishment, reproduction and persistence.

Project Safety

The project manager will serve as or designate a project safety officer to monitor all actions associated with the project, and take corrective action to remedy unsafe activities. All personnel

involved with the project will receive safety training regarding chemical application and transportation hazards of the project. Personnel applying chemicals will be required to pass a pesticide applicator test and obtain a non-commercial pesticide applicator license from the Department of Agriculture and Food for State of Utah. Before treatment, all personnel will review the safety precautions for each product label. Project participants will be involved in identifying other hazards and actions that may jeopardize safety during the project and asked to provide suggestions for minimizing safety risks. Only personnel certified in the use of explosives will be involved in the removal of beaver dams or other obstructions.

Wash stations for chemical spill onto skin or into eyes will be provided for each drip station and at each chemical loading and unloading station. Wash stations will consist of the following items: clean water, hand soap, towels, eye wash bottle and moist towelettes. Tyvek coveralls, nytrile gloves, respirators equipped with organic vapors cartridges and goggles will be provided for all personnel handling rotenone.

Spill Contingency

Two commercial formulations of rotenone will be used for the Range Creek Project, Prenfish liquid emulsifiable rotenone (EPA Registration No. 655-422) and Prentox powdered rotenone (EPA Registration No. 655-691). Rotenone will be purchases a few weeks before treatment and stored in locked sheds at the UDWR Southeastern Office in Price, Utah. Liquid rotenone will be purchased in 55-gallon barrels and 5-gallon buckets drums while powdered rotenone will be purchased in 110-pound drums.

Potassium permanganate will also be purchased just before treatment and stored at the UDWR Southeastern Office in Price, Utah. Chemicals will be transported to the project home base via trucks on Monday during the week of treatment. In the event a spill occurs, the first priority will be containment of the spilled material. Shovels will be used for immediate containment or to channelize the spilled material into a containment area. The following actions will be taken as necessary to contain a spill on the ground:

1) Stopping the spillage at its source;
2) Diking in pools as appropriate;
3) Using materials such as clay, soil, sawdust, or straw to absorb standing material or collection of standing rotenone by pump or sponge and deposition into target area;
4) Neutralizing the spill site with potassium permanganate.

The Safety Officer will be responsible for immediately reporting ground spills of liquid rotenone over 20 gallons and powdered rotenone or potassium permanganate over 100 pounds to the following entities:

1) UDWR Regional Supervisor
2) Bureau of Land Management Price Ranger District Supervisor

2.3 Alternative B – No Action

Under the no action alternative, a PUP or a NPDES would not be granted and BLM would not issue authorization of project activities of which include chemical treatments of Range Creeks. Negative impacts to CRCT would continue to occur through competition and hybridization with the non-native fishes that are currently above the fish barrier.

3.0 AFFECTED ENVIRONMENT

3.1 Introduction

This chapter presents the potentially affected existing environment (i.e., the physical, biological, social, and economic values and resources) of the impact area as identified in the Interdisciplinary Team Checklist found in Appendix A and presented in Chapter 1 of this assessment. This chapter provides the baseline for comparison of impacts/consequences described in Chapter 4.

3.2 General Setting

Range Creek Canyon is located in the West Tavaputs Plateau area of Carbon and Emery Counties, Utah, 23 miles east of Price, Utah. Range Creek is a perennial stream draining a watershed of approximately 145 square miles from the stream's source near Bruin Point at 10,200 feet to its confluence with the Green River 38 miles downstream.

Range Creek has laid out a sinuous, narrow strips of alluvium that wind back and forth between the toes of the remnant ridges separating the many side canyons. The stream supports brown trout (salmo trutta) and two special status fish species, Bluehead Sucker (Catostomus discobolus) and flannel mouth sucker (Catostomus latipinnis). There is a riparian zone along the stream with Fremont cottonwood (Populus fremontii), box elder (Acer negundo), Woods Rose (Rosa woodsii) and coyote willow (Salix exigua).

3.3 Affected Resources

The following resources have been identified to be present within the project and they have the potential for relevant impacts that need to be analyzed in detail.

3.3.1 Surface Water Quality

Range Creek is a cold water stream. Its headwaters originate near the divide at Nine Mile Creek and Upper Grassy Trail Creek. According to Utah's 2016 Integrated Report, the upper assessment unit is considered impaired due to low levels of dissolved oxygen. The report lists the beneficial uses as 1C; domestic drinking Water, 2B; infrequent primary contact recreation (e.g. wading, fishing), 3A; cold water fishery/aquatic life; Use Class 4; agricultural uses (crop irrigation and stock watering). Middle Range Creek is considered supporting all its beneficial uses. These include class 1C; domestic drinking water, 2B: infrequent primary contact recreation (eg wading, fishing), 3C; cold water fishery, class 4; agricultural uses (crop irrigation and stock watering).

3.3.2 Fish and Wildlife Excluding USFWS Designated Species

<u>Fisheries</u>

Both brown trout and yellowstone cutthroat trout (both non-native) including CRCT (native) at one time existed within Range Creek. In 2001, tissue samples were collected and submitted to a lab in Montana. Their findings documented the cutthroat in Range Creek were 17.4% Bonneville cutthroat trout and the rest Colorado River cutthroat. Due to the high occurrence of crossbreeding between these species it can be assumed that any existing CRCT that remain within the system today are not of pure strain and have hybridized with the existing brook trout and Yellowstone cutthroat populations. Two other species of fish, the speckled dace and mountain sucker were also documented in Range Creek in 2002.

Amphibians

Although detailed amphibian surveys have not been conducted within the Range Creek drainage, the following species are listed as native species and may be present in the project area: Great Basin spadefoot, northern leopard frog, tiger salamander, western chorus frog, and Woodhouse's toad (UDWR 2011).

Aquatic Invertebrates

Range Creek offers a wide variety of aquatic invertebrates. Within this stream system the Utah Division of Water Quality and Utah Division of Wildlife Resources has conducted stream surveys that consist of three major components: water quality, riparian characteristics, and macro-invertebrate sampling. These surveys have been conducted within Range Creek from 2002, 2005, 2006, and 2014. Stream surveys conducted within Range Creek have occurred at four stations: Range Creek below Wilcox, Range Creek above the pump house, Range Creek above the Cherry Meadow crossing and Range Creek 2 miles upstream from the Ranch House upstream from the diversion dam. Based on those surveys, this stream offers a multitude of family taxon of macro-invertebrates including mayflies, midges, riffle beetles, stoneflies, blackflies and caddisflies and is considered to be a healthy stream habitat. Macro-invertebrate surveys would be conducted prior to rotenone treatments and again following treatments within the same year and will continue in following years.

3.3.3 Waste and Hazardous Materials

Currently, there are no known hazmat sites within the project area. However, Rotenone is considered an acute health hazard under SARA Title III. Rotenone, when formulated as an emulsified concentrate, is highly toxic and carries the signal word DANGER on its label. Local effects on the body include conjunctivitis, dermatitis, sore throat, and congestion. Ingestion produces effects ranging from mild irritation to vomiting. Inhalation can cause increased respiration followed by depression and convulsions (Briggs 1992). No human fatalities have been reported, perhaps because rotenone is usually sold in low concentrations (1-5% formulation) and because its irritating action causes prompt vomiting. Proper handling and disposal of materials associated with Rotenone are crucial to ensuring the safety of everyone involved.

4.0 ENVIRONMENTAL IMPACTS

4.1 Direct and Indirect Impacts

This section analyzes the direct and indirect impacts of the proposed action to those resources described in chapter 3, Affected Environment. Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.

4.1.1 Alternative A – Proposed Action

4.1.1.1 Surface Water Quality

This project would deliberately introduce rotenone, a natural botanical piscicide, to surface waters to kill non-native fish species, but the anticipated impacts would be short-term. The chemical abilities of rotenone are registered by the Environmental Protection Agency (EPA) and are deemed safe to use to eradicate fish species when applied according to label instructions. There are three ways in which rotenone can be detoxified once applied.

The first detoxification method involves dilution by other water sources. This may be accomplished by groundwater or surface water mixing with treated water and diluting the rotenone below 2.0 parts per billion (ppb) which is the threshold that requires deactivation (Finalyson et al. 2010).

The second method of detoxification involves the application of an oxidizing agent such as potassium permanganate. This dry crystalline substance is mixed with water to detoxify the rotenone. Potassium permanganate (KMnO4) will be applied at 2.0 ppm to neutralize rotenone treated water just below the barrier location on Range Creek. At an application rate of 2.0 ppm the neutralization zone should be approximately 30 minutes. That is, rotenone treated water should be completely neutralized within the time it travels for 30 minutes below where potassium permanganate is added. Within the 30-minute neutralization zone, fish mortality will still occur and below the neutralization zone mortality should not be observed.

The third and most common method of rotenone detoxification is to allow the rotenone to naturally breakdown. Rotenone is susceptible to natural detoxification through an assortment of mechanisms, but warm water temperatures and exposure to sunlight are the two factors with the greatest influence on degradation rate (Ware 2002). Rotenone released into relatively warm water (~15°C) is expected to fully detoxify within 2 to 4 weeks (Dawson et al. 1991). The ultimate breakdown products of rotenone are carbon dioxide and water. More information is available online at: http://www.dfw.state.or.us/fish/local_fisheries/diamond_lake/FAQs.asp.

In summary, a rotenone treatment within Range Creek would be neutralized by the incorporation of potassium permanganate located just below the barrier on Range Creek. The BLM is requiring a PUP to be approved prior to project implementation. This project would also be conducted in compliance with the federal Clean Water Act.

4.1.2 Fish and Wildlife Excluding USFWS Designated Species

<u>Fisheries</u>

Rotenone would have direct impacts on the existing fish species within Range Creek. Rotenone kills fish not by removing oxygen from the water, but by inhibiting oxygen transfer and cellular respiration. The proposed action will remove all fish species within the Range Creek system. Once the non-natives are removed from the stream, CRCT will be restocked into the drainage either during the fall after treatment or early the next summer. Annual monitoring in the stream will occur for five years to document CRCT establishment, reproduction and persistence.

Amphibians

Amphibians are anticipated to have direct impacts to rotenone treatments. However, adult amphibians and reptiles are less sensitive than fish and aquatic invertebrates as rotenone is absorbed through gill epithelium rather than skin membranes (Ling 2003). Direct effects from rotenone applications at typical concentrations may not fatally affect adult amphibians, but would likely result in mortality to tadpoles and juvenile salamanders (California Department of Fish and Game. 1985). Although adult amphibians may avoid water when it becomes toxic, amphibians may be subject to other threats such as predation and/or dehydration. Tadpoles cannot escape water and would experience high levels of mortality if a lethal dose is applied.

However, project activities would occur in September when larval amphibian populations are not likely to be present. It is anticipated that post-treatments would increase amphibian populations due to reduced fish predation on larvae and other aquatic invertebrates. Indirect effects to amphibians would occur through the reduction of macro-invertebrates, a main food source for amphibians. As a result, it is determined that project activities may impact amphibians, but would be short-term and is unlikely to affect the population viability of a given species.

Aquatic Invertebrates

Rotenone is toxic to aquatic invertebrates. Following most rotenone treatments, a reduction in invertebrate abundance and taxa richness is anticipated from project activities (Ling 2003). However, as direct effects to aquatic invertebrate abundance and diversity would drastically reduce it has been suggested through previous studies that rapid recovery of invertebrates occur after post-treatments (Vinson et al. 201 0). This is likely due to the discharge of predation pressure with both fish and invertebrate predators removed by rotenone treatments (Lintermans & Taro 2003, Vinson et al. 201 0). It is anticipated that species richness and diversity would continue to be low until treatments cease. These impacts would be minor and short-term and is not anticipated to inhibit the establishment of CRCT.

4.1.3 Waste and Hazardous Materials

The use of Rotenone will be strictly monitored in handling and use during the course of this project. Treatment sites along the stream will be assembled to prepare for treatment. Training for safety measures and PPE (personal protective equipment) will be enacted prior to performance of the proposed action. All personnel that come in contact or can come in contact with the product must be trained in use and control in case of an accidental release or spill. All waste will be disposed of in a proper manner using a certified disposal unit. A spill control and countermeasure plan will be prepared and made part of this plan.

Trash would be confined in a covered container and disposed of in an approved landfill. No burning of any waste will occur due to this project. Human waste will be disposed of in an appropriate manner in an approved sewage treatment center.

Rotenone is a restricted use pesticide due to aquatic, acute inhalation and acute oral toxicity. This means rotenone is toxic to fish, aquatic invertebrates and amphibians and is harmful to humans. Therefore, rotenone must be used by licensed pesticide applicators or under direct supervision of a certified applicator. As addressed in the proposed action, rotenone treatments will be applied by DWR personnel. A pesticide application record is required to be submitted to the BLM within 24 hours of chemical application on any BLM-administered lands.

Rotenone is a botanical pesticide registered by the EPA for piscicidal uses. Rotenone blocks electron transport within cell mitochondria. Rotenone is a liquid emulsifiable that contains 5 percent rotenone, with 85 to 95 percent of other solvents, carriers and emulsifiers. Other ingredients vary by manufacturer, but may include Volatile Organic compounds (VOC) such as xylene, trichloroethylene, toluene, and trimethylbenzene, as well as semi VOC such as naphthalene, 1-methyl naphthalene, and 2-methly naphthalene (Finlayson et al. 2000). For example, the Material Safety Data Sheet for Prentiss Prentox (Appendix B) indicates that it contains naphthalene, 1, 2, 4 trimethylbenzene, acetone, and two unidentified emulsifiers. According to the EPA_RED (United States Environmental Protection Agency, 2007), rotenone is mobile to moderately mobile in soil and sediment and has a relatively low potential for bioconcentrating in aquatic organisms and is not persistent in the environment due to its low vapor pressure which limits its volatility. When released in water, rotenone generally degrades quickly through abiotic mechanisms, with a half-life of a few days to several weeks depending on water temperature.

Under the proposed action, rotenone would be neutralized with potassium permanganate, which oxidizes rotenone quickly and results in manganese oxide which is a biologically inactive compound. Neutralization of rotenone typically occurs within the time it travels downstream for 30 minutes below where potassium permanganate is added. Within the 30-minute neutralization zone, fish mortality will still occur and below the neutralization zone mortality should not be observed. Depending on the stream flow, both rotenone and potassium permanganate would be oxidized within 0.25 to 0.5 miles downstream of the barrier location.

Oral ingestion of fish, aquatic organisms and amphibians treated with rotenone by terrestrial wildlife is not highly toxic to terrestrial wildlife. Wildlife absorbs rotenone in the stomach and intestines relatively slow and once absorbed, rotenone is effectively broken down into less toxic byproducts by the liver. In order for rotenone to be toxic to terrestrial wildlife at the concentrations proposed for this project, a species would have to consume an excessive amount of treated water. Overall, terrestrial wildlife would not be affected by the rotenone treatments proposed.

Indirect effects could include dead fish accumulating along the creek banks, which could increase nutrient inputs to the creek possibly leading to algal blooms and subsequent drops in dissolved oxygen. Terrestrial wildlife would have a decrease in food availability for insectivorous and piscivorous birds and mammals. These impacts are expected to be minor and temporary.

4.2 Alternative B – No Action

4.2.1 Surface Water Quality

Under the No Action Alternative, a PUP or a NPDES would not be granted and BLM would not authorize the treatment of Range Creek by the UDWR with liquid emulsifiable rotenone and

its neutralizing agent. Beaver dams would not be removed and water quality concerns would not occur from the existing stream channel and water flow.

4.2.2 Fish and Wildlife Excluding USFWS Designated Species

Under the No Action Alternative, a PUP or a NPDES would not be granted and BLM would not issue authorization of project activities of which include chemical treatments of Range Creek. Negative impacts to CRCT would continue to occur through competition and hybridization with the non-native fishes that currently exist within the system. Potential impacts to species as listed in the Proposed Action would not occur.

4.2.3 Waste and Hazardous Materials

Under the No Action Alternative, a PUP or a NPDES would not be granted and BLM would not authorize the treatment of Range Creek by the UDWR with liquid emulsifiable rotenone and its neutralizing agent. Issues regarding waste handling and human safety would therefore not be required. Non-native fish species would continue to compete with native fish and hybridization with the non-native fishes that currently exist within the system would continue. Other potential impacts to fish, aquatic organisms and amphibians as listed in the proposed action would not occur.

4.3 Cumulative Impacts Analysis

Cumulative impacts are those impacts resulting from the incremental impact of an action when added to other past, present, or reasonably foreseeable actions regardless of what agency or person undertakes such other actions.

4.4.1.1 Cumulative Impact Area (CIA)

The Cumulative Impact Analysis Area (CIAA) is defined as Range Creek consisting of approximately 26 stream miles. The stream within the CIAA was extended an additional 2 miles downstream to be considered sufficient as any downstream impacts for the project (i.e., detoxification and oxidation of rotenone and potassium permanganate) are not likely to be transmitted to extend into the Green River reach.

4.4.1.2 Past and Present Actions

As the CIAA is entirely within the creek boundary, very few past and present actions have occurred or are likely to occur with the exception of casual fishing pressure and irrigation purposes, which are anticipated to continue.

4.4.2.3 Reasonable Foreseeable Action Scenario

As the CIAA is entirely within the creek bounda**ry**, very few reasonably foreseeable future actions are likely to occur with the exception of **casual** fishing pressure and irrigation purposes, which **are** anticipated to continue. There has been discussion about removing the diversion dams along portions of the stream to help facilitate spawning CRCT, but this would only improve the habitat and make it more suitable and sustainable for CRCT.

4.4.2.4 Cumulative Impact Analysis

The project involves very minor adverse impacts to most resources and beneficial impacts to fisheries. When combined with the level of past, present, and reasonably foreseeable actions, the impacts of the proposed action would not be of a magnitude sufficient to result in an accumulation of impacts to resources identified in Appendix A.

5.0 CONSULTATION AND COORDINATION

5.1 Introduction

The issue identification section of Chapter 1 identifies those issues analyzed in detail in Chapter 4. The ID Team Checklist provides the rationale for issues that were considered but not analyzed further. The issues were identified through the public and agency involvement process described in sections 5.2 and 5.3 below.

5.2 Persons, Groups, and Agencies Consulted:

Calvin Black – *Utah Division of Wildlife Resources - Sportfish/Aquatics Asst. Manager*
Justin Hart – *Utah Division of Wildlife Resources - Aquatics Manager*
Benjamin Brown – *Utah Division of Environmental Quality - Environmental Scientist*
Benjamin Holcomb – *Utah Division of Environmental Protection – Biological Assessment Program Coordinator*
Manuel Hart – *Ute Mountain Tribe – Chairman*
Darwin St. Clair, Jr. – *Eastern Shoshone – Chairman*
Raymond Loretto – *Pueblo of Jemez – Governor*
Val Panteah – *Pueblo of Zuni – Governor*
Jason Walker – *Northwestern Band of Shoshone Nation – Chairman*
Gordon Howell – *Ute Indian Tribe – Chairman*
Nathan Small – *Shoshone-Bannock Tribes – Chairman*
Ben Shelly – *Navajo Nation – President*
Gari Lafferty – *Paiute Indian Tribe of Utah – Chairwoman*
Herman Honanie – *Hope Tribal Council – Chairman*
Clement Frost – *Southern Ute Tribal Council – Chairman*

5.3 Summary of Public Participation

This environmental assessment was made publicly available for review and comment on the BLM ePlanning website on 10/27/2016. The comment period was 30 days and ended on 11/27/2016.

5.4 List of Preparers

Name	Title	Critical Element(s), Other Resources
Jerrad Goodell	Aquatics Ecologist	Project Leader
Jared Reese	Wildlife Biologist	Project Leader / Wildlife
Stephanie Bauer	Range Management Specialist	Invasive Species & Noxious Weeds
Jeffery Brower	Hydrologist / Hazmat	Water Quality & Waste

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LIST OF ACRONYMS

BLM……..……Bureau of Land Management
CRCT……Colorado River Cutthroat
DR…….. Decision Record
EA……..……Environmental Assessment
EIS. ……..Environmental Impact Statement
EPA……...…..Environmental Protection Agency
ESA……...….Endangered Species Act
FONSI ……..…Finding of No Significant Impact
NEPA ……...…National Environmental Policy Act
NPDES……..… National Pollutant Discharge Elimination System
PPM……...……..Parts Per Million
PUP……..Pesticide Use Plan
T&E……..……Threatened and Endangered
UDWR……..…….Utah Department of Wildlife Resources
USFWS……..United States Fish and Wildlife Service

APPENDICES

APPENDIX A – Interdisciplinary Team Checklist
APPENDIX B –Material Safety Data Sheet for Prentiss Prentox

APPENDIX A - Interdisciplinary Team Checklist

INTERDISCIPLINARY TEAM CHECKLIST

Project Title: Range Creek Rotenone Treatment

NEPA Log Number: DOI-BLM-UT-G020-2016-0024-EA

Project Leader: Jared Reese – Wildlife Biologist

DETERMINATION OF STAFF: ***(Choose one of the following abbreviated options for the left column)***

NP = not present in the area impacted by the proposed or alternative actions
NI = present, but not affected to a degree that detailed analysis is required
PI = present with potential for relevant impact that need to be analyzed in detail in the EA
NC = (DNAs only) actions and impacts not changed from those disclosed in the existing NEPA documents cited in Section D of the DNA form. The Rationale for Determination column may include NI and NP discussions.

Determination	Resource/Issue	Rationale for Determination	Signature	Date
RESOURCES AND ISSUES CONSIDERED (INCLUDES SUPPLEMENTAL AUTHORITIES APPENDIX 1 H-1790-1)				
NI	Air Quality & Greenhouse Gas Emissions	Emissions from earth-moving equipment, vehicle traffic, drilling and completion activities, separators, oil storage tanks, dehydration units, and daily tailpipe and fugitive dust emissions could adversely affect air quality. No standards have been set by the EPA or other regulatory agencies for greenhouse gases. In addition, the assessment of greenhouse gas emissions and climate change is still in its earliest stages of formulation. Global scientific models are inconsistent, and regional or local scientific models are lacking so that it is not technically feasible to determine the net impacts to climate due to greenhouse gas emissions. It is anticipated that greenhouse gas emissions associated with this action and its alternative(s) would be negligible.	Jeffrey Brower	09/29/15
NP	BLM natural areas	After review of the approved RMP and GIS there is no BLM natural areas located within the proposed action.	Matt Blocker	4/13/16
NI	Cultural Resources	The Area of Potential Effect for the proposed project meets the definition for a small routine undertaking under the Programmatic Agreement Between the ACHP, the BLM-Utah and the USHPO per 36CFR800.3(a)(1). No historic properties eligible for inclusion on the National Register of historic places are located within the proposed project area. Pursuant to 36CFR800 a determination of no adverse effect is made.	Amber Koski	7/11/16
NI	Cultural: Native American Religious Concerns	No Tribal concerns have been identified to date.	Amber Koski	7/11/16

Determination	Resource/Issue	Rationale for Determination	Signature	Date
NP	Designated Areas: Areas of Critical Environmental Concern	After review of the approved RMP and GIS there is no ACEC's located within the proposed action.	Josh Winkler	02/01/2016
NP	Designated Areas: National Trails and Backways	After review of the approved RMP and GIS there is no National Trails and Backways located within the proposed action.	Matt Blocker	4/13/16
NP	Designated Areas: Wild and Scenic Rivers	After review of the approved RMP and GIS there is no Wild and Scenic Rivers located within the proposed action.	Matt Blocker	4/13/16
NI	Designated Areas: Wilderness Study Areas	The proposed action is located within Turtle and Desolation Canyon Wilderness Study Areas. The proposed action does not require motorized access or any surface disturbance within the WSA and is for a short and defined timeframe. The projects goals are to return the stream to a more natural state by returning native fish species. The use is temporary thus satisfying the non-impairment standard. Stocking of native fish species may be permitted if the purpose of stocking is to reestablish or maintain a species adversely affected by human influence. Fish species may be stocked within the former historical range of the species.	Matt Blocker	7/15/16
NI	Environmental Justice	No minority or economically disadvantaged communities or populations would be disproportionately adversely affected by the proposed action or alternatives.	Jake Palma	02/01/2016
NP	Farmlands (prime/unique)	No prime or unique farmlands, as identified by the NRCS, based on soil survey data for the county are located in the project area; therefore, this resource will not be carried forward for analysis.	Jeffrey Brower	09/29/15
NI	Fuels/Fire Management	Fuels treatments restoring ecosystem health and providing for firefighter safety are currently being conducted within the Range Creek drainage. Fuels treatments in the area are expected to continue over the next few years. The project, as proposed will not impact fire/fuels to a degree that requires further detailed analysis.	Joshua Relph	6/28/16
NI	Geology / Minerals / Energy Production	The Range Creek corridor does not pass through or over any existing fluid or solid federal mineral leases or permits. While there may be either coal and/or oil and gas resources within the corridor, the short term duration of this action has no impact on potential development of any of the energy or mineral resources.	Mike Glasson	05/16/2016
NI	Lands/Access	A review of LR2000 and the Master Title Plats showed that the proposed action is compatible with the existing land use and authorized right-of-ways. There are no conflicts with other land use authorizations.	Connie Leschin	09/22/2015
NI	Lands with wilderness characteristics	After review of the approved RMP and GIS there is no lands with wilderness characteristics located within the proposed action.	Matt Blocker	5/24/16

Determination	Resource/Issue	Rationale for Determination	Signature	Date
NI	Livestock Grazing	The proposed treatment methods and the effects of the treatment would not affect livestock grazing. However, private land owners within the Range Creek drainage should be notified of the treatment schedule in order to keep livestock away from the stream during the treatment period(s).	Karl Ivory	2/3/16
NI	Paleontology	Paleontological resources are not at all affected by this project. There will be no surface disturbance and so not even a possibility of damage to paleontological resources.	Michael Leschin	2/1/2016
NP	Vegetation: BLM Sensitive	After review of the BLM database for sensitive plant species it has been determine that there are no BLM sensitive species within the project area.	Karl Ivory	2/3/16
PI	Vegetation: Invasive Species / Noxious Weeds	Rotenone is a pesticide that is extremely toxic to fish and humans. The proposed action will eliminate all fish within the project area. The reintroduction of native fish should not occur for a minimum of 2-4 weeks after treatment. An NPDES permit may need to be acquired from the EPA before treatment. A PUP is required for all chemical applications applied on BLM administered lands prior to treatments and a PAR is required to be submitted to the BLM office within 24 hours after chemical applications. This issue will be analyzed in the same section as "Wastes" under the heading "Wastes and Hazardous Materials."	Stephanie Bauer	3/9/16
NP	Vegetation: Threatened, Endangered, Proposed, or Candidate	After review of the BLM database for sensitive plant species it has been determine that there are no threatened, endangered, proposed or candidate plant species within the project area.	Karl Ivory	2/3/16
NI	Vegetation: Vegetation Excluding USFW Designated Species and BLM Sensitive Species	The proposed treatment methods and treatment effects would not affect the upland vegetation within the project area.	Karl Ivory	2/3/16
NI	Vegetation: Wetland/Riparian	The proposed treatment methods and treatment effects would not affect the riparian/wetland vegetation within the project area.	Karl Ivory	2/3/16
NI	Vegetation: Woodlands/Forestry	Woodlands/forestry would not be affected by the treatment of the stream because the chemical used is target specific to fish.	Stephanie Bauer	3/9/16
NI	Rangeland Health Standards	The proposed treatment would allow the replacement of non-native fish species with native fish species which would enable the Rangeland Health Standards to be met as the standards relate to habitat for special status species. Rangeland Health Standards specifically affected by the proposed action are addressed in the Surface Water Quality section and the Non-USFWS Designated Wildlife section.	Karl Ivory	2/3/16

Determination	Resource/Issue	Rationale for Determination	Signature	Date
NI	Recreation	The proposed action is located within the Range Creek Special Recreation Management Area (SRMA) with management directives that can be found in appendix R-9 page 11 of the RMP. The interim management of the Range Creek SRMA until the BLM and the State of Utah develop a joint management plan for the BLM and the State land is an implementation decision. This plan closes the area to mechanical use, does not allow camping or campfires, and limits access to hiking and horseback. This area is not considered a pristine destination for fishing which would be the greatest short term impact from the treatment. The lower range creek drainage areas bellow the treatment plan and outside the management area is still open for public use and fishing opportunities. The short term treatment within the proposed action would not impact the casual user within the area.	Josh Winkler	02/01/2016
NI	Socio-Economics	No impact to the social or economic status of the county or nearby communities would occur from this project due to its small size in relation to ongoing development throughout the PFO.	Jake Palma	02/01/2016
NI	Soils	No soils disturbance is planned in association to the project	Jeffrey Brower	02/03/16
NI	Visual Resources	The proposed action is located within a Visual Resource Management (VRM) I, II & III management area. The proposed action with no permanent structures or equipment placement would have no impacts to the VRM directives within the area.	Josh Winkler	02/01/2016
PI	Wastes (hazardous/solid)	The use of Rotenone will be strictly monitored in handling and use during the course of this project. All personnel that come in contact or can come in contact with the product must be trained in use and control in case of an accidental release or spill. All waste will be disposed of in a proper manner using a certified disposal unit. A spill control and countermeasure plan will be prepared and made part of this plan. Trash would be confined in a covered container and disposed of in an approved landfill. No burning of any waste will occur due to this project. Human waste will be disposed of in an appropriate manner in an approved sewage treatment center.	Jeffrey Brower	02/03/16
NI	Water: Floodplains	The proposed project will be performed in the stream, but no disturbance to floodplains is anticipated.	Jeffrey Brower	02/03/16
NI	Water: Groundwater Quality	The half-life of rotenone is sufficiently short to prevent introduction to groundwater sufficient to affect water quality.	Jeffrey Brower	02/03/16

Determination	Resource/Issue	Rationale for Determination	Signature	Date
NI	Water: Hydrologic Conditions (stormwater)	No activities affecting the surface drainage patterns will be associated with the project.	Jeffrey Brower	02/03/16
PI	Water: Surface Water Quality	Strict adherence to labeling and safety protocol will be observed. Deactivation or reutilization of the Rotenone will be monitored to ensure success.	Jeffrey Brower	02/03/16
NP	Wild Horse / Burro	The project area is outside any Wild Horse and Burro Herd Management Areas	Mike Tweddell	03/09/16
NP	Wildlife: BLM Sensitive	Based upon GIS review, there are no known populations of BLM Sensitive animal species that occur within the proposed action area. Colorado River Cutthroat Trout historically occupied the creek but are believed to have been extirpated from the system.	Jared Reese	02/03/16
NI	Wildlife: Migratory Birds (including raptors)	Although migratory birds may be utilizing the area surrounding the proposed action; due to the relatively short duration and low intensity of implementation, impacts to these species are not anticipated.	Jared Reese	02/03/16
PI	Wildlife: Non-USFWS Designated	The proposed action has the potential to affect fish, amphibians, and aquatic invertebrates located with the Range Creek system. Further analysis should be considered to determine what those impacts may be.	Jared Reese	02/03/16
NI	Wildlife: Threatened, Endangered, Proposed or Candidate	Although the area surrounding the proposed action has modeled habitat for Mexican Spotted Owl, due to the relatively short duration and low intensity of implementation, impacts to these species are not anticipated. In addition, due to the seasonal timing of the project, the relative long distance from the Green River (over 8 miles) and the low amount of water flow out of Range Creek, there should be no T&E fish species impacted from the proposed action.	Jared Reese	02/03/16

FINAL REVIEW:

Reviewer Title	Signature	Date	Comments
Environmental Coordinator			
Authorized Officer			

APPENDIX B –Material Safety Data Sheet for Prentiss Prentox

SAFETY DATA SHEET

Cat# 2248-250, -1000, Rotenone **SDS DATE: Feb 15, 2013**

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Rotenone

PRODUCT CODES: Cat# 2248-250, -1000

MANUFACTURER: BioVision, Inc.
ADDRESS: 155 S. Milpitas Boulevard, Milpitas, CA 95035

EMERGENCY PHONE: 858-373-8066
CHEMTREC PHONE:
OTHER CALLS: 408-493-1800
FAX PHONE: 408-493-1801

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

Component	Description	Volume	Safety Information
Rotenone	Solid	2248-250: 250 mg 2248-1000: 1 g	See below

SECTION 3: HAZARDS IDENTIFICATION

Product Name/Chemical Name	CAS Number	EC-No.	Molecular Weight	Chemical Formula
Rotenone	83-79-4	201-501-9	394.42	$C_{23}H_{22}O_6$

Rotenone:
Emergency Overview
OSHA Hazards: Target organ effect, Toxic by ingestion, Harmful by skin absorption, Irritant
GHS Classification: Acute toxicity, Oral (Category 3)
Acute toxicity, Dermal (Category 4)
Skin irritation (Category 2)
Eye irritation (Category 2A)
Specific target organ toxicity – single exposure (Category 3)
Acute aquatic toxicity (Category 1)
GHS Label elements, including precautionary statements
Pictogram:

Signal word: Danger
Hazard statement(s): H301 Toxic if swallowed.
H312 Harmful in contact with skin.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.
H400 Very toxic to aquatic life.
Precautionary statement(s): P261 Avoid breathing dust/fume/gas/mist/vapors/spray.
P273 Avoid release to the environment.
P280 Wear protective gloves/protective clothing.
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
HMIS Classification
Health hazard: 2
Chronic health hazard: *
Flammability: 0
Physical hazards: 0
NFPA Rating
Health Hazard: 2
Fire: 0
Reactivity Hazard: 0
Potential Health Effects
Inhalation: May be harmful if inhaled. Causes respiratory tract irritation.
Skin: Harmful if absorbed through skin. Causes skin irritation.
Eyes: Causes eye irritation.
Ingestion: Toxic if swallowed.

SECTION 4: FIRST AID MEASURES

General advice: Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.
If inhaled: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
In case of skin contact: Wash off with soap and plenty of water. Consult a physician.
In case of eye contact: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
If swallowed: Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5: FIRE-FIGHTING MEASURES

Condition of flammability: Not flammable or combustible.
Suitable extinguishing media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Special protective equipment for fire-fighters: Wear self-contained breathing apparatus for firefighting if necessary.
Hazardous combustion products: Hazardous decomposition products formed under fire conditions— see section 10.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions: Wear respiratory protection. Avoid dust formation. Avoid breathing vapors, mist, or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.
Methods for cleaning up: Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed.
Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place.
Recommended storage temperature: -20 °C.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Components	CAS-No.	Value	Control parameters	Basis
Rotenone	83-79-4	TWA	5 mg/m³	USA. ACGIH Threshold Limit Values (TLV)
Remarks:	Not classifiable as a human carcinogen.			
		TWA	5 mg/m³	USA. OSHA – TABLE Z-1 Limits for Air Contaminants – 1910.1000
		TWA	5 mg/m³	USA. Occupational Exposure Limits (OSHA) – Table Z-1 Limits for Air Contaminants
		TWA	5 mg/m³	USA. ACGIH Threshold Limit Values (TLV)
	Central nervous system impairment. Upper respiratory tract irritation. Eye irritation. Not classifiable as a human carcinogen.			
		TWA	5 mg/m³	USA. NIOSH Recommended Exposure Limits

Personal protective equipment

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Eye protection
Face shield and safety glasses. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection
Complete suit protecting against chemicals. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hygiene measures
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Property	Rotenone
Appearance:	White to yellow solid
pH:	No data available
Water Solubility:	No data available
Other Solubility:	DMSO (100 mM) or EtOH (5 mM)
Boiling Point (°C):	210 -220°C (410-428 °F)
Melting Point (°C):	159-164 °C (318-327 °F)
Flash Point (°C):	No data available
Ignition Temperature (°C):	No data available
Density:	1.270 g/cm^3 at 20 °C (68 °F)

SECTION 10: STABILITY AND REACTIVITY

Property	Rotenone
Chemical stability	Stable under recommended storage conditions
Conditions to avoid:	Air light
Materials to avoid:	Strong oxidizing agents
Hazardous decomposition products:	Carbon oxides

SECTION 11: TOXICOLOGICAL INFORMATION

Rotenone:
Acute toxicity: LD50 Oral – rat – 60 mg/kg
LD50 Dermal – rabbit – >1,000 mg/kg
Skin corrosion/irritation: no data available
Serious eye damage/eye irritation: no data available
Respiratory or skin sensitization: no data available
Germ cell mutagenicity: no data available
Carcinogenicity: This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

- IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
- ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
- NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
- OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity: no data available
Teratogenicity: no data available
Specific target organ toxicity – single exposure (GHS): Inhalation – may cause respiratory irritation.
Specific target organ toxicity – repeated exposure (GHS): no data available
Aspiration hazard: no data available
Potential Health Effects

- **Inhalation:** May be harmful if inhaled. Causes respiratory tract irritation.
- **Skin:** Harmful if absorbed through skin. Causes skin irritation.
- **Eyes:** Causes eye irritation.
- **Ingestion:** Toxic if swallowed.

Signs and Symptoms of Exposure: Exposure may cause vomiting, diarrhea, convulsions, and/or central nervous system depression. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.
Synergistic effects: no data available
Additional information: RTECS: not available

SECTION 12: ECOLOGICAL INFORMATION

Rotenone:
Persistence and degradability: no data available
Toxicity: Toxicity to fish: LC50 – Carassius auratus (goldfish) – 0.41-0.6 mg/l – 96 h
Toxicity to daphnia and other aquatic invertebrates: EC50 – Daphnia pulex (Water flea) – 0.074-0.134 mg/l – 48 h
Bioaccumulative potential: Bioaccumulation: Lepomis macrochirus – 30 d; Bioconcentration factor (BCF): 26
Mobility in soil: no data available
PBT and vPvB assessment: no data available
Other adverse effects: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life.

SECTION 13: DISPOSAL CONSIDERATIONS

Product: Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.
Contaminated packaging: Dispose of as unused product.

SECTION 14: TRANSPORT INFORMATION

Rotenone:
DOT (US): UN-number: 2811, Class: 6.1, Packing Group: III; Proper shipping name: Toxic solids, organic, n.o.s. (Rotenone); Marine pollutant: Yes; Poison Inhalation Hazard: No
IMDG: UN-number: 2811, Class: 6.1, Packing Group: III; EMS-No: F-A, S-A; Proper shipping name: TOXIC SOLID, ORGANIC, N.O.S. (Rotenone); Marine pollutant: Yes
IATA: UN-number: 2811, Class: 6.1, Packing Group: III; Proper shipping name: Toxic solid, organic, n.o.s. (Rotenone)

SECTION 15: REGULATORY INFORMATION

Rotenone:
OSHA Hazards: Target organ effect, Toxic by ingestion, Harmful by skin absorption, Irritant
SARA 302 Components: SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.
SARA 313 Components: SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title II, Section 313.
SARA 311/312 Hazards: Acute Health Hazard, Chronic Health Hazard
Massachusetts Right To Know Components: Rotenone, CAS-No. 83-79-4; Revision Date: 1991-07-01
Pennsylvania Right To Know Components: Rotenone, CAS-No. 83-79-4; Revision Date: 1991-07-01
New Jersey Right To Know Components: Rotenone, CAS-No. 83-79-4; Revision Date: 1991-07-01
California Prop. 65 Components: This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

EU regulations

Component	Risk Phrases	Safety Phrases
Rotenone	R25, R36/37/38, R50/53	S22, S24/25, S36, S45, S60, S61

SECTION 16: OTHER INFORMATION

DISCLAIMER:
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. BioVision, Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.